

# CORRIDORS OF THE FUTURE PHASE II APPLICATION



## SECTION 1: CLEAR NEED



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No better example of a “Corridor of the Future” could be envisioned than an innovative solution for commercial trucking on Interstate-70 (I-70). This application, supported by the Missouri, Illinois, Indiana, and Ohio Departments of Transportation (DOTs), proposes constructing dedicated truck-only lanes spanning four states, with the potential to be expanded across the nation.

The I-70 dedicated truck-only lanes (TOLs) project can address major issues facing transportation today; namely, congestion, safety, and the enormous growth and time-sensitivity of freight logistics. The proposed TOLs project can provide a corridor of such length and breadth as to change America’s national model for interstate transportation.

The vision for this project entails dedicated TOLs where superior reliability, mobility, and safety add value to the trucking industry and freight movements across the country. The vision of this project is a vision of the future, providing the economy of scale required to influence, and potentially shift, freight movements across the Midwest and the United States.

This section of the application provides a physical description of the Corridor, including a map and discussions detailing its connections to existing transportation infrastructure. It also quantifies the current and future congestion, addresses the national impact of the Corridor on freight and traffic congestion, and presents a profile of I-70 in each state. This section defines the need for the project.

As will be described, there is a clear need to reduce congestion and improve the mobility and safety on I-70 with TOLs because:

- **Truck Volumes:** Heavy vehicles make up an average of 21.5 percent in urban areas and 27.5 percent in rural areas of the overall traffic on I-70 in Missouri, Illinois, Indiana, and Ohio;
- **Congestion and Commerce:** Truck speeds on I-70 are slower than parallel east-west corridors in the Midwest, affecting business and industry;
- **Safety:** Truck-car crashes on I-70 result in loss of life on the Corridor and incident-induced delay; and



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- **New Standard for the Interstate of the Future:** The I-70 project can provide a needed long-distance, truck-focused model that can set the standard for other interstate corridors in the future.

### 1.1. MAP AND PHYSICAL DESCRIPTION

**Figure 1-1** illustrates the project area for the dedicated TOLs proposed in this application. **Figure 1-1** also shows 2000 Census population densities and boundaries of the Metropolitan Planning Organizations (MPOs) in the vicinity of the proposed TOLs project. More than 11 million people live within a 25 mile area of the Corridor.

The I-70 Corridor TOLs project extends from the I- 435 beltway on the eastern part of Kansas City, Missouri to the Ohio/West Virginia border near Bridgeport, Ohio/Wheeling, West Virginia. The I-70 project area includes 789 centerline miles. The I-70 Corridor system includes the beltways around St. Louis (I-270 and I-370), Indianapolis (I-465) and Columbus (I-270), which are expected to directly benefit from the improvement of I-70, includes 847 centerline miles of interstate highways. The system encompasses more than 3,600 lane miles of interstate. Data and discussion of the beltways are included because the proposed project may, after feasibility studies are completed, route some of the TOLs along beltways.

Interstate 70 is a gateway of commerce and mobility for a breadth of industries throughout America's heartland. In 2000, more than 11.1 million people and more than 6.8 million jobs were within 25 miles of I-70 in Missouri, Illinois, Indiana and Ohio.

Population in the counties within 25 miles of the Corridor is expected to increase by 13 percent by 2030 to 13.7 million, and employment is expected to rise by 39 percent to 9.5 million. Five percent of forecast 2030 employment is expected to be directly in the transportation, communications and utilities industry group, which is expected to grow in the area surrounding I-70 by 22 percent in the period from 2000 to 2030<sup>1</sup>.

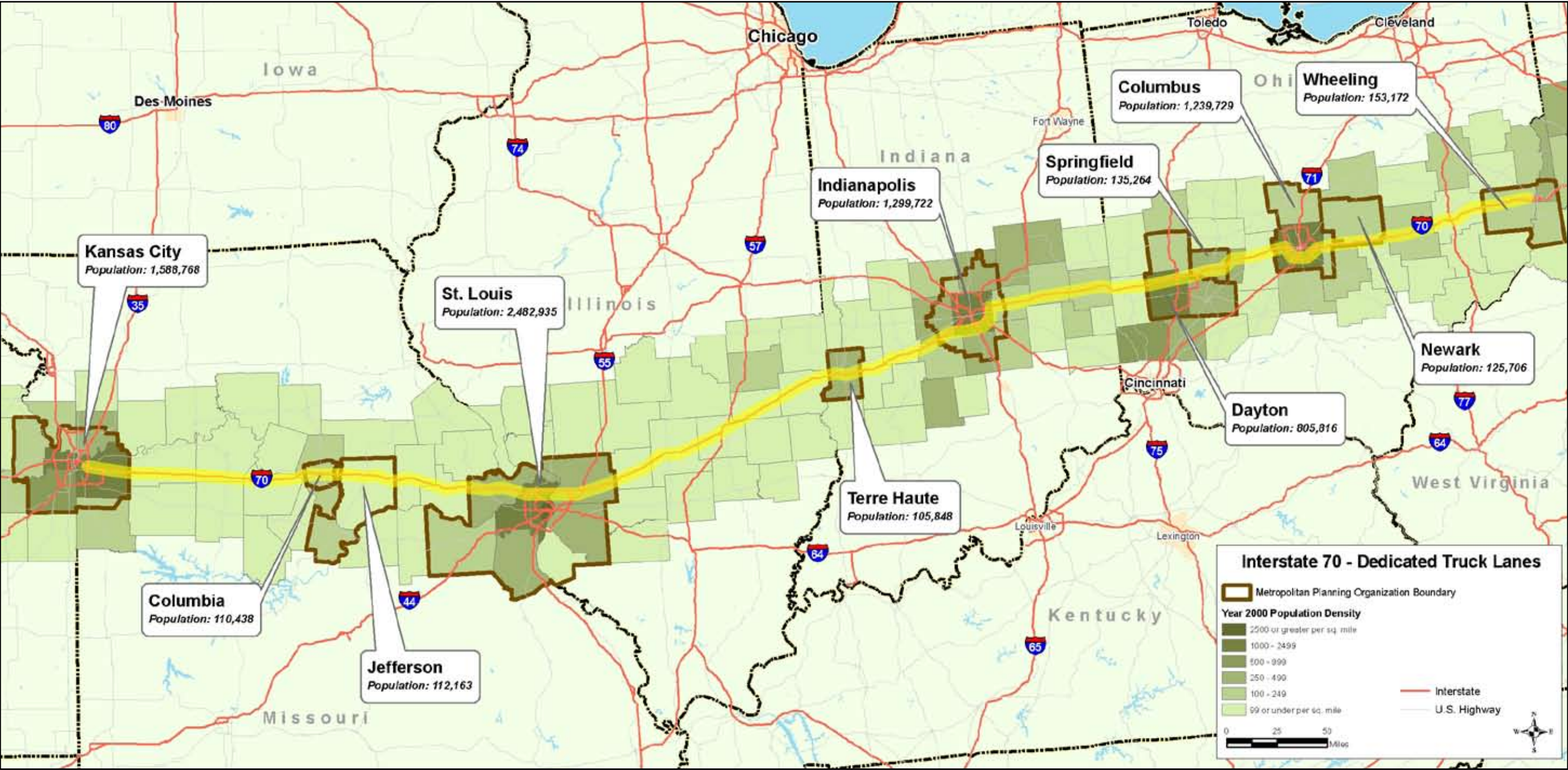
The Corridor connects the major metropolitan areas of Kansas City and St. Louis, Missouri; Indianapolis, Indiana; Dayton and Columbus; Ohio as well as smaller metropolitan areas of Columbia; MO, Madison County and Terre Haute Indiana; Springfield, Newark, Steubenville and St. Clarisville, Ohio; and Wheeling, West Virginia. It crosses the Mississippi and Ohio Rivers, is within 50 miles of the greater Pittsburgh, PA urban area, parallels national railroad lines and is within 25 miles of six major international airports and air cargo hubs, including St. Louis, Indianapolis, Dayton, Wright Patterson, Columbus, and Rickenbacker. Because I-70 plays a critical role for both freight and personal transportation, it is crucial that the Corridor perform optimally for a mix of commercial trucking and personal travel purposes.

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<sup>1</sup> Woods and Poole 2006 CEEDS



Figure 1-1: I-70 Dedicated Truck Only Lanes Project Area



Source: Wilbur Smith generated map using U.S. Census Bureau data

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Figure 1-2: Connections to Existing Transportation Infrastructure



Source: Wilbur Smith generated map using National Transportation Atlas Databases (NTAD) 2006 - Bureau of Transportation Statistics

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Figure 1-2 illustrates the Corridor's connections with other existing transportation infrastructure. The significance of these connections is discussed in Sections 1.3.2, 1.4, 1.5, and 2.2.2.

The I-70 Corridor project area connects to nine north-south and two east-west interstate routes.

- North/South Interstate Connections,
  - I-29 and I-35 in the Kansas City, Missouri area,
  - I-55 in the St. Louis, Missouri area,
  - I-57 in south central Illinois,
  - I-65 and I-69 in the Indianapolis, Indiana area
  - I-75 north of Dayton, Ohio area,
  - I-71 in the Columbus, Ohio area,
  - I-77 near Cambridge, Ohio;
- East/West Interstate Connections,
  - I-44 and I-64 in the St. Louis, Missouri area,
  - I-74 in Indianapolis;

Seventeen passenger and air cargo airports are served by the I-70 Corridor project area. These include three major airports in the Kansas City area, four near St. Louis, and four near Columbus.

All seven Class 1 U.S. railroads cross or parallel the I-70 project area. The two major players east of the Mississippi River are CSX Transportation and the Norfolk Southern railway. West of the Mississippi, the BNSF Railway and Union Pacific Railroad cover roughly the same territory. The Kansas City Southern Railway is a smaller system, mainly forming part of the NAFTA Railway corridor from the Midwest into Mexico. The Canadian National Railway and Canadian Pacific Railway have trackage lines in the project area.

The I-70 Corridor also crosses the Missouri, Mississippi and Ohio Rivers. These are some of the most heavily traveled rivers on the inland waterway system. The ports in the Kansas City and St. Louis area contain major truck/waterport intermodal facilities. The eastern end of the Corridor is on the Ohio River and several major ports.

## 1.2. SYSTEM CONDITION

The condition of the system is one of the many factors that impacts performance. This section presents data and analysis highlighting the issues of congestion and safety facing I-70. The data will demonstrate that this vital Corridor is threatened by:



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- Recurring urban bottlenecks which undermine the efficiency of freight and personal transportation in major cities along the Corridor; and
- Crash-induced delays which undermine the reliable delivery of goods utilizing the Corridor.

These are problems of national significance. The I-70 TOLs project will certainly reduce congestion and incident-induced delays by separating trucks and passenger vehicles on I-70. However, the efficiencies provided to both truck and automobile traffic on I-70 with also benefits other congested parallel routes by attracting long distance traffic from these corridors. This Corridor is also made more attractive by being far enough south to avoid the major "Lake Effect" snow events that effect major segments of the I-80 corridor. It can provide the potential for congestion relief in cities throughout the Midwest.

Figure 1-3: Truck Flows on I-70 and Other Interstates, 2035



Source: FHWA Freight Analysis Framework (FAF<sup>2</sup>)

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Figure 1-3 illustrates the strategic relationship and significance of I-70 to the parallel Corridors of I-80 (to the north) and I-40 (to the south) as truck routes for the mobility of trans-national traffic through the United States. A TOLs solution to maximize the mobility of I-70 has the potential to improve the utilization of I-70 as a preferred route for truck flows throughout the Midwest. It could potentially attract traffic from I-40 and I-80, thereby reducing congestion on these parallel routes. Figure 1-3 also demonstrates that if no improvements are made to I-70 in the Indianapolis Metropolitan area, this area will be one of our nation's worst bottlenecks, affecting both North/South and East/West traffic.

### 1.2.1. Capacity Deficiencies

I-70 faces significant congestion due to capacity deficiencies. A successful deployment of truck-only facilities on I-70 can provide both a solution to these issues and a demonstration project for other interstates with similar issues.

*I-70 faces significant congestion due to capacity deficiencies.*

Table 1-1 describes the Corridor in terms of its conditions and performance with respect to mobility and capacity based on 2004 HPMS (Highway Performance Monitoring System) data submittals from the states of Missouri, Illinois, Indiana, and Ohio.

Table 1-1: Capacity of the I-70 Corridor

Measure	I-70 Project Area		All US Interstates	
	Urban	Rural	Urban	Rural
Centerline Miles	297 (35%)	550 (65%)	15,373 (32%)	31,474 (68%)
Lane Miles	1416 (38%)	2242 (62%)	84,023 (40%)	128,012 (60%)
MVMT	21,936 (55%)	17,763 (45%)	459,768 (63%)	267,395 (37%)

Source: WSA Generated Table from HPMS and State Level Data

Table 1-1 shows that, while the I-70 Corridor project area is slightly more urban compared to all interstates, it has a lower concentration of MVMT (million vehicle miles traveled) in urban areas. Eighteen percent of I-70's urban VMT occurs in congested conditions, as identified by general daily capacity deficiencies. From a capacity standpoint, I-70 should offer greater mobility than many interstates in both urban and rural areas. However, an assessment of truck speeds as shown by Figures 1-4 and 1-5 and utilization of the Corridor (as shown on Figures 1-7 and 1-8) shows that truck speeds on I-70 lag behind other corridors in the Midwest.

*Speeds on I-70 lag behind other Midwest corridors.*

Figures 1-4 and 1-5 illustrate the aggregated on-board truck position data produced during truck movement and obtained through the Freight Performance Measures

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(FPM) initiative, an ongoing FHWA sponsored study led by the American Transportation Research Institute (ATRI), June 2006. The figures offer a snapshot using 30 days of FPM data concerning conditions on I-70, compared with six other interstates making national connections in the Midwest.

Figure 1-4: 30-Day Average Travel Speeds for 7 Corridors: Northbound and Eastbound



Source: American Transportation Research Institute (ATRI), June, 2006



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Figure 1-5: 30-Day Average Travel Speeds for 7 Corridors: Southbound and Westbound



Source: ATRI, June 2006

These figures show that the average travel speeds for trucks on I-70 are lower than for other east-west corridors (such as I-80 and I-40). It is notable that the travel rates shown in Figures 1-4 and 1-5 show truck speeds in RURAL areas between 50 and 55 mph throughout Ohio, Indiana, and Illinois. This is significantly less than the speeds greater than 60 mph observed on most of the other interstates in the Midwest outside of urban areas.

It should be noted, in Ohio speed limits for trucks are set at 55 mph. Two reasons for this are to reduce the number of truck-car crashes and to reduce the severity of collisions, if they do occur between cars and heavy trucks. This safety benefit comes at the expense of longer travel times and less mobility for trucks on I-70.

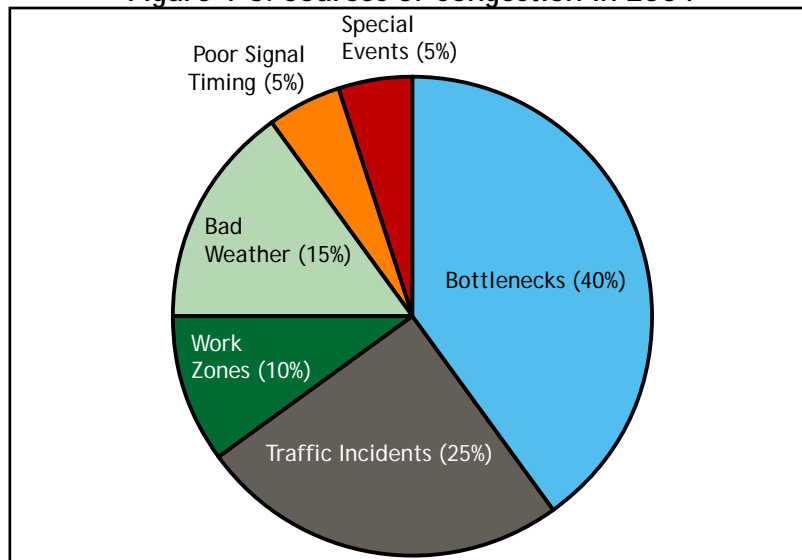
Improving mobility on I-70 for trucks in the future requires a strategy which separates trucks from passenger cars and supports higher truck speeds, while improving safety and guarding against the possibility of crash-induced delay.



### 1.2.2. Causes for Congestion

Nationally, based on FHWA data, the two leading causes for congestion are bottlenecks on capacity deficient roadways (accounting for 40 percent of congestion in 2004) and crash incidents (accounting for 25 percent of congestion in 2004). Both of which would be dramatically reduced on I-70 with the development of TOLs. Figure 1-6 illustrates the overall sources of congestion in the United States in 2004.

Figure 1-6: Sources of Congestion in 2004



Source: FHWA

Because capacity alone does not explain the lower truck travel speeds on I-70, the need to facilitate higher-speed truck traffic, while minimizing the risk of crash-induced delay, emerges as a potential focus area for reducing congestion on I-70 and enhancing its overall utilization as part of the interstate network.

*Truck involved crashes on the I-70 Corridor through the four states of this application may have accounted for more than 2.3 million vehicle hours of incident-induced delay in 2004.*

In 2004, the I-70 project area had more than 10,000 crashes. Truck involved crashes accounted for 18 percent of 2004 crashes on the I-70 Corridor, but 36 percent of fatalities. The majority of these fatalities involved passenger car drivers and occupants.

In a 2004 study, "Temporary Losses of Capacity and Impacts on Performance," the Oak Ridge National Laboratory estimated that, on average, a fatal interstate crash results in 962 vehicle hours of delay. A non-fatal crash results in 1,230 vehicle hours of delay. By these

averages, truck involved crashes on the I-70 Corridor through the four states of this application may have accounted for more than 2.3 million vehicle hours of incident-induced congestion in 2004.

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The impact of incident-induced crashes is also significantly more costly, both for the trucking industry and for shippers, than recurring bottlenecks due only to capacity deficiencies. This is because the unpredictable nature of crash incidents cannot be planned for in business or supply chain operations. An improvement to I-70 which will reduce incident-induced delay for truck-related crashes, and safeguard truck traffic from the delay of non-truck crashes, will greatly enhance the reliability and performance of this system for interstate commerce. Such an improvement will enhance I-70's appeal as a preferred route for trucking-dependent commerce.

### 1.2.3. Utilization of I-70

Lower travel speeds on I-70 have an impact on its utilization and its "attractiveness" to the trucking industry as a cross-country route. In addition to travel speeds, the previously referenced FPM study, led by ATRI in June 2006, also examined the utilization of U.S. interstates for truck traffic. In this analysis, each one mile segment was given a utilization score based on the number of trucks that passed over that segment within a 30 day period. A ratio of 10-1 was then created, with 1 representing the lowest utilization level and 10 representing the highest. Figures 1-7 and 1-8 observe the directional utilization of I-70 through the Midwest, relative to other corridors.

*Lower travel speeds on I-70 have an impact on its utilization and its "attractiveness" to the trucking industry as a cross-country route.*

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Figure 1-7: Eastbound and Northbound Utilization



Source: ATRI, June 2006



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Figure 1-8: Westbound and Southbound Utilization



Source: ATRI, June 2006

These figures show that, among the three major east-west corridors in the Midwest (I-80, I-40 and I-70), I-70 is the least utilized corridor for trucking. A truck-focused solution to recurring- and incident-induced delay on the I-70 Corridor can attract the flow of east-west interstate traffic through the Midwest, improving the efficiency of trucking on parallel routes and improving efficiencies of trucking dependent industries nationally. When combined with other freight-related efficiencies enabled by TOLs (such as higher uniform load limits and larger truck sizes), the Corridor becomes a still greater route of choice for long-haul, time-sensitive freight movements.

### 1.2.4. Urban Area Congestion

The impact of recurring congestion is most keenly felt in the Corridor's largest metropolitan areas of Kansas City, St. Louis, Indianapolis, Dayton, and Columbus. According to a study by the Texas Transportation Institute, based on 2003 data, congestion was responsible for nearly 98 million lost hours of time, more than 63 million gallons of excess fuel consumption, and more than \$1.6 billion in overall congestion costs to system

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users in major metropolitan areas of the I-70 Corridor. Table 1-2 shows the impacts of congestion on the Corridor's metropolitan areas.

**Table 1-2: I-70 Congestion through Major Cities (2003)**

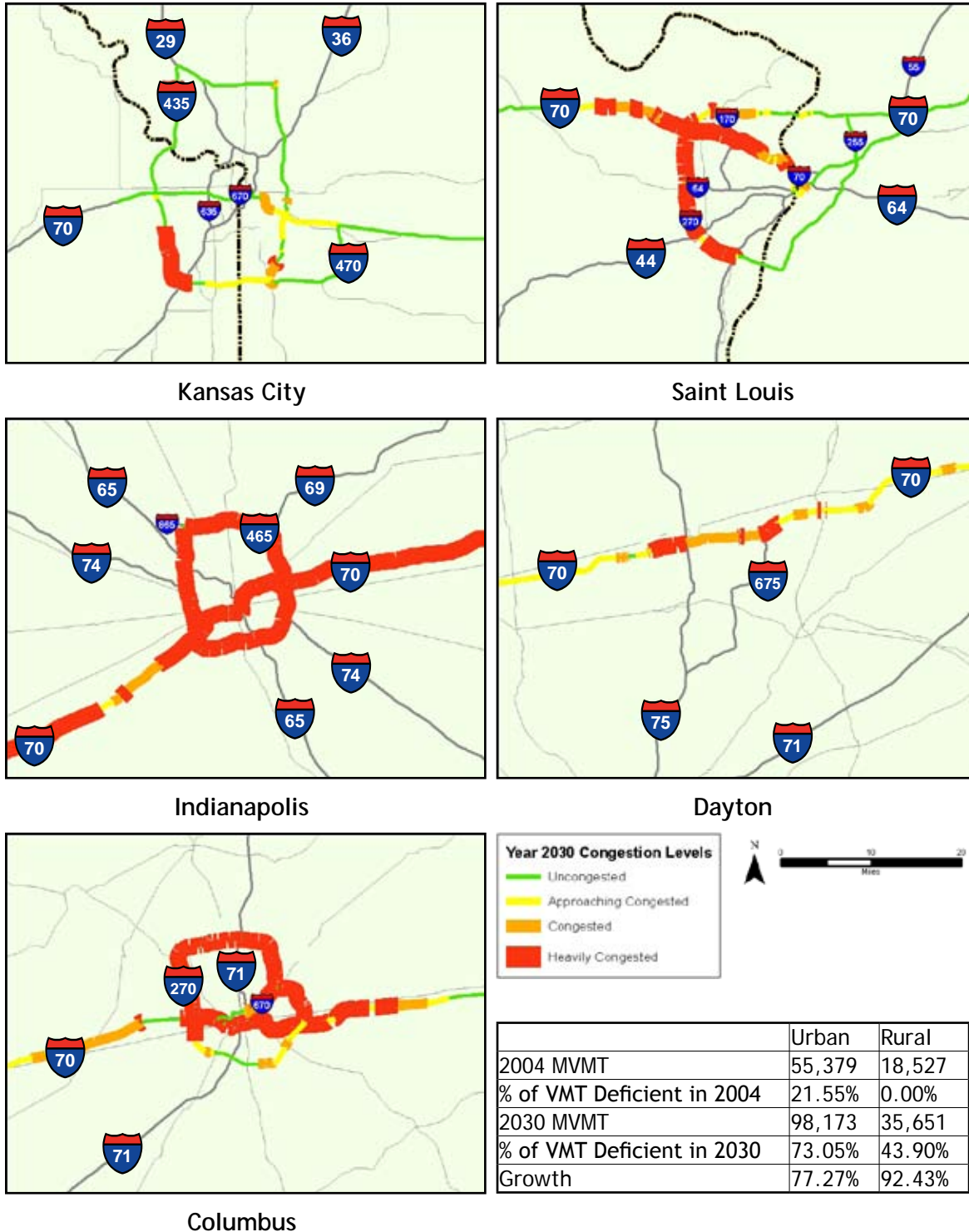
Metropolitan Area	Travel Delay (1,000 Hours)	Excess Fuel Consumed (1,000 Gallons)	Overall Congestion Cost in Million \$
Kansas City, KS/MO	13,874	9,095	\$ 235
St. Louis, MO/IL	39,936	26,362	\$ 675
Indianapolis, IN	21,358	14,032	\$ 362
Dayton, OH	4,438	2,836	\$ 75
Columbus, OH	18,550	11,507	\$ 314

*Source: TTI Urban Mobility Report, 2004 & 2005*

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Figure 1-9: Urban Areas where 2030 Congestion on the I-70 System is Expected to be Most Severe



Source: Wilbur Smith Associates, 2007



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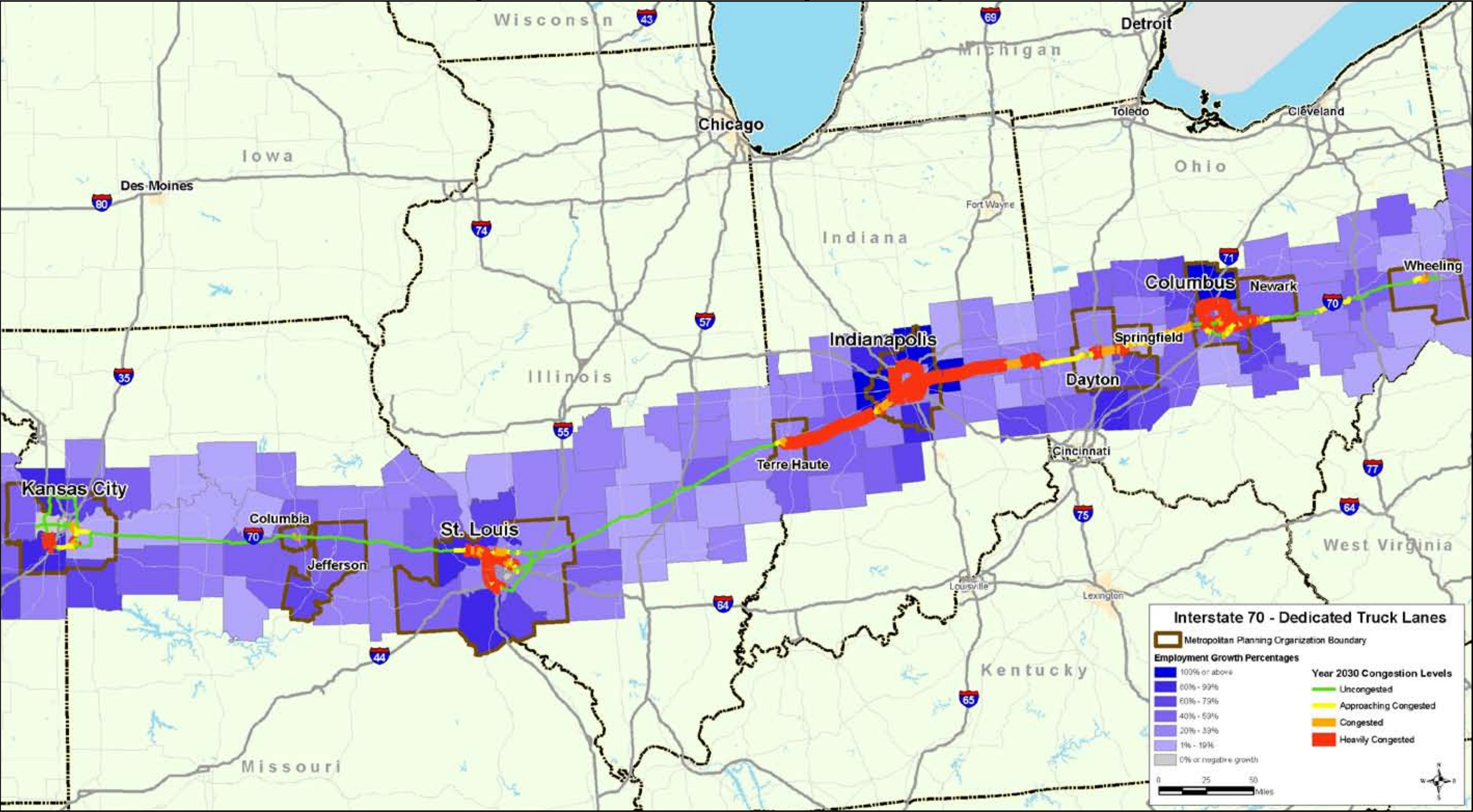
Figure 1-9 illustrates where 2030 urban area congestion on the I-70 system is expected to be most severe. It shows that VMT in the urban areas of the I-70 Corridor is expected to grow by more than 77 percent from 2004 to 2030, with the percentage traveled under congested conditions rising from around 21 percent in 2004 to more than 73 percent in 2030. This congestion is expected to have a significant impact on I-70's mobility and

*The principal I-70 urban area's percentage travel under congested conditions rises to more than 73 percent in 2030.*

accessibility for commerce and intermodal connections, as both I-70 and its supporting belt roads reach volumes exceeding their daily capacities in Indianapolis and Columbus in 2030. The accessibility of both Dayton and St. Louis will also be significantly impeded by interstate congestion in 2030.

Figure 1-10 illustrates where future capacity deficiencies threaten the accessibility of the I-70 Corridor to growing concentrations of employment and commerce throughout the Corridor. The figure shows congestion expected in 2030 relative to growth in the density of employment along the Corridor.

Figure 1-10: Year 2030 Anticipated Future Congestion and Employment Growth



Source: Wilbur Smith Generated Map Utilizing 2004 HPMS and Woods and Poole 2006 CEEDS Data

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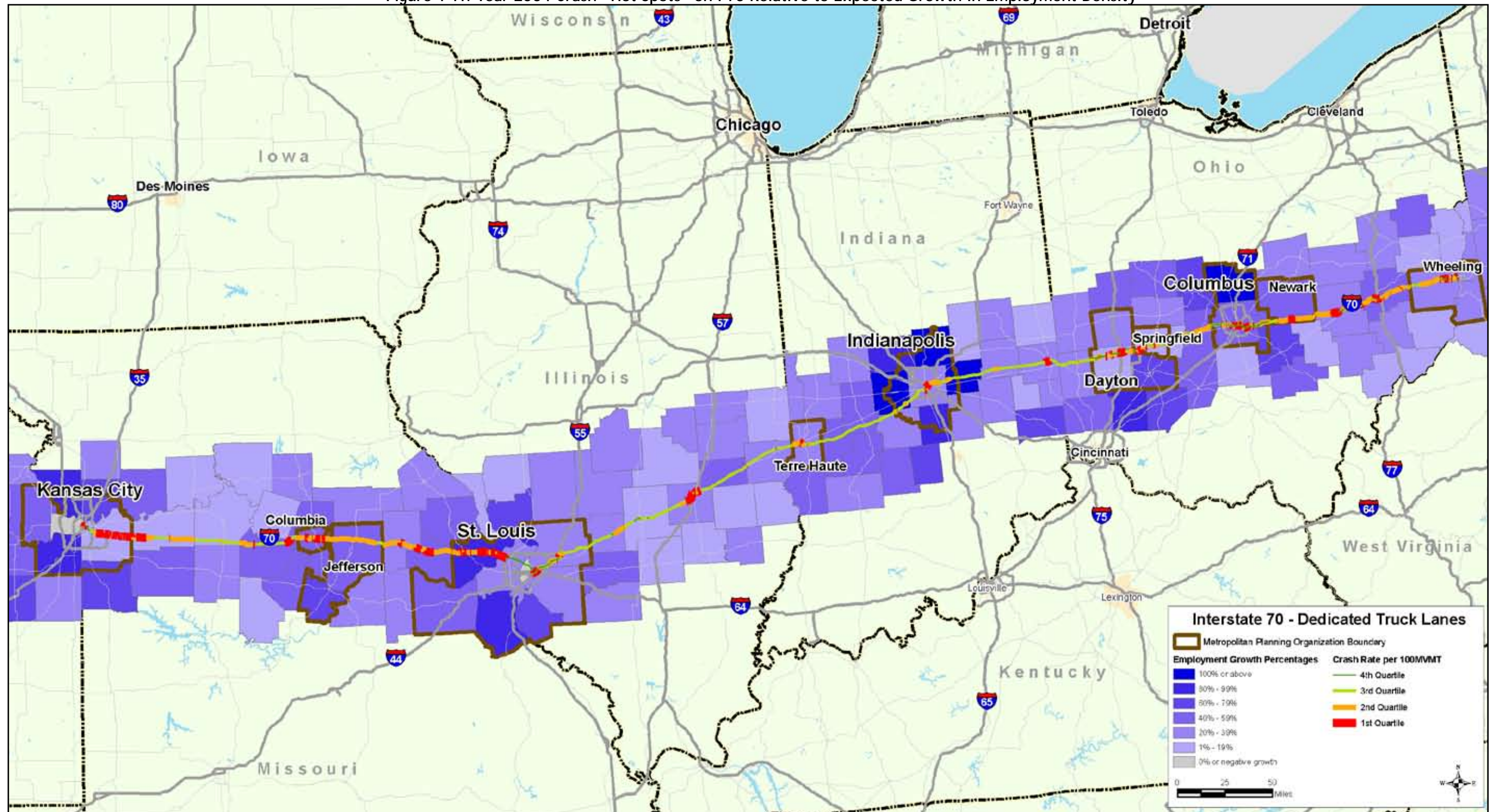
As shown in Table 1-3 and in Figure 1-10, significant growth in the density of employment surrounding Indianapolis will combine with overall rising traffic volumes, causing capacity deficiencies on the I-70 Corridor throughout the state of Indiana.

Projected increases in employment density surrounding Columbus and Dayton is also expected to cause interstate capacity deficiencies in Columbus, with I-70 approaching its capacity throughout western Ohio by the year 2030. The problem of future capacity deficiencies is expected to be more localized in Illinois and Missouri; however, if the Corridor is not improved, incident-induced delay is also likely to be responsible for increasingly congested conditions as employment density rises in the areas surrounding St. Louis, Columbia, and Kansas City.

Figure 1-11 illustrates the concentration of crash events in 2004 relative to areas of expected employment growth along the Corridor. The figure shows that today's high-crash areas of I-70, if not addressed in the future, will impede mobility and accessibility to growing areas of commerce and economic activity.

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Figure 1-11: Year 2004 Crash "Hot-Spots" on I-70 Relative to Expected Growth in Employment Density



Source: Wilbur Smith Generated Map Utilizing 2004 HPMS and State Level Crash Data



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Figure 1-11 shows that, in addition to the urbanized areas of the Corridor, Ohio and Missouri have the highest concentration of crashes per MVT of the states in the I-70 Corridor. This is important because it shows that even in non-congested areas, such as rural sections of Missouri, there are factors that may cause congestion and delay, further compromising the reliability of travel on I-70 in 2030 and beyond. The figure also shows that high concentrations of crash incidents make the Corridor subject to crash-induced delay in high-growth areas such as central Ohio, Indianapolis, and St. Louis.

In 2030, both incident-induced delay and emerging capacity deficiencies will threaten the performance of I-70. Taken together, Figures 1-10 and 1-11 show that these emerging sources of congestion will be widespread throughout the four-state project area. This will require a holistic and innovative solution to support commerce and economic performance for the I-70 project area.

### 1.3. NEED TO SUPPORT FREIGHT-INTENSIVE COMMERCE

To support commerce, the conditions and performance of I-70 must be improved with respect to the mobility and safety of truck traffic. The above analysis has demonstrated how existing crashes and projected bottlenecks on I-70 threaten the accessibility of growing concentrations of employment and commerce. This section further examines the utilization of I-70 as a corridor of commerce with a high concentration of trucking dependent industries and vital linkages to national freight and commerce networks.

*I-70 needs a truck-oriented solution to support key industries.*

Because of its high concentration of manufacturing, retail and wholesale trade and transportation and communications activity, I-70 is more dependent on trucking than the interstate highway system as a whole. This is due to the composition of industries located in proximity to the Corridor. The conditions and performance challenges facing the Corridor are vitally important to national commerce for these and other major industries in the United States. Table 1-3 gives a general overview of the population density, employment density, and expected increases in population and employment on I-70 from 2000 to 2030.

Table 1-3: Increasing Population and Employment Density (per square mile) Within 25 Miles of the Proposed I-70 Corridor Project Area

I-70 Population and Employment Forecast 2000 - 2030			
Economic Factor	2000	2030	Expected Increase
Population	11,114,084	13,679,574	23%
Population Density/sq.mi	27,143	31,684	17%
Employment	6,846,385	9,502,391	39%
Employment Density/sq.mi	17,829	23,084	29%

Source: Woods and Poole, 2006 CEEDS

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The increases in employment density as shown in **Table 1-3** and illustrated in **Figures 1-10** and **1-11** are highly sensitive to the existing and emerging commercial trucking safety and capacity issues shown. This is because the nature of expected 2030 employment on the Corridor is forecast to be especially dependent on truck traffic.

**Table 1-4** compares the expected year 2030 industrial composition of the counties surrounding I-70 (within 25 miles) to industry employment forecasts for America as a whole. The right most column of **Table 1-4** gives the location quotient for each industry group. The location quotient measures the relative concentration of expected 2030 employment in each industry in the I-70 Corridor area in comparison to the nation as a whole. When this quotient is greater than one, the industry is said to be part of the economic base of the Corridor.

Manufacturing, retail and wholesale trade are found to comprise the economic base of the I-70 Corridor project area. Manufacturing is expected to account for nine percent of jobs in the area surrounding I-70 in 2030 compared to only seven percent of jobs nationally. Retail and wholesale trade are also concentrated in the area surrounding the Corridor, with retail employment accounting for 17 percent of expected 2030 jobs in the I-70 area, and only 15 percent nationally. Both of these industries are highly dependent on both commercial trucking and in-house trucking and transportation operations conducted by manufacturing and retail firms.

**Table 1-4: Expected Trends in I-70 Industry Composition in 2030**

I-70 Area Forecast Industry Composition Relative to US Employment 2030			
Employment By Industry	Expected Percentage of I-70 Area Employment 2030	Expected Percentage of National Employment 2030	I-70 Industry Share/National Industry Share (Location Quotient)
Services	36%	39%	0.95
Retail Trade	17%	15%	1.10
Government	13%	13%	0.98
Manufacturing	9%	7%	1.15
Finance/Insurance/Real Estate	8%	8%	0.96
Construction	6%	6%	1.00
Transportation/Communication and Utilities	5%	5%	1.03
Wholesale Trade	4%	4%	1.09
Farming	1%	1%	0.93
Agricultural Services	1%	1%	0.78
Mining	0%	0%	0.58
All Industries	100%	100%	

*Source: WSA Generated Table Using Woods and Poole 2006 CEEDS Data*

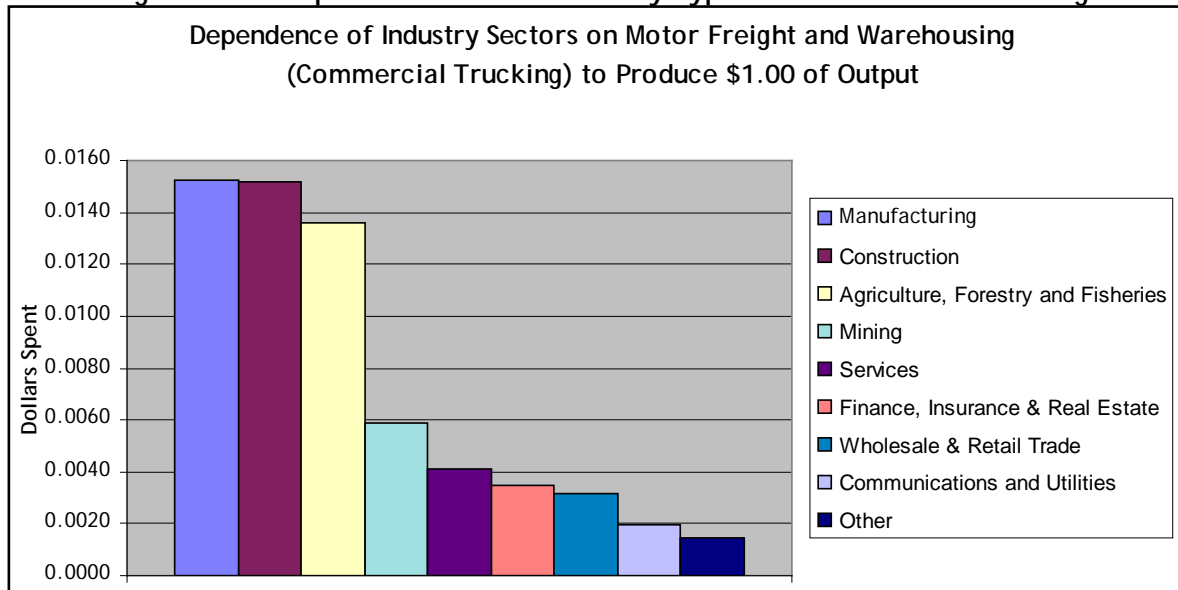


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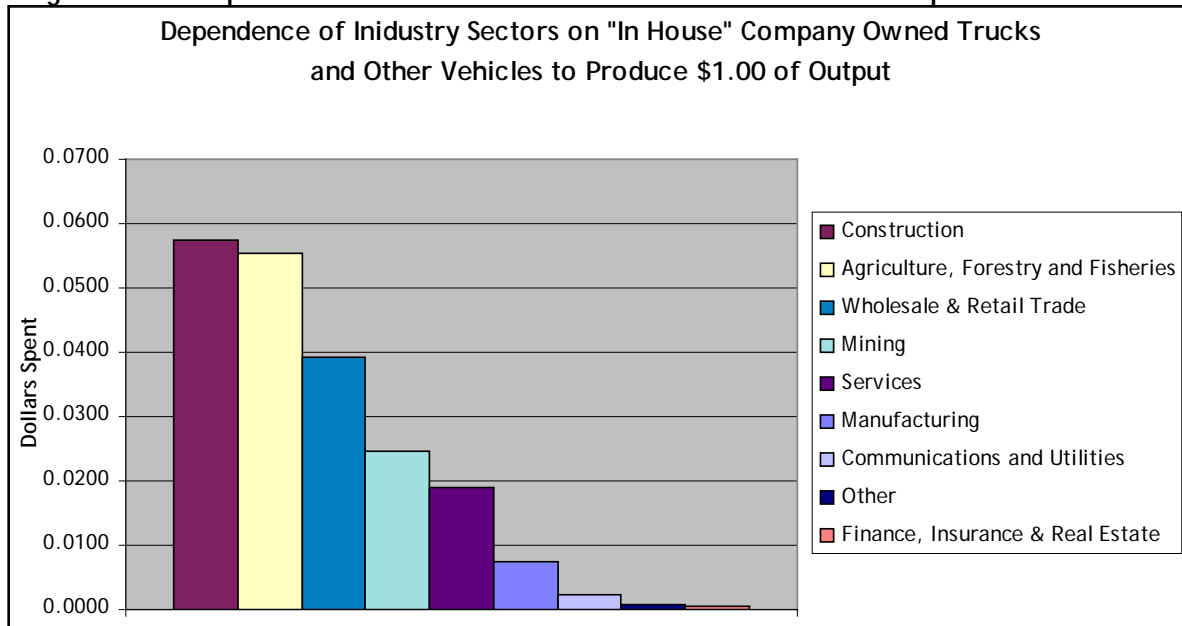
In the year 2000, the U.S. Bureau of Transportation Statistics (BTS) published Transportation Satellite Accounts describing the reliance of different industries on transportation modes/sectors in terms of the value of transportation services each industry must consume to produce one dollar of output. The Transportation Satellite Accounts provides a general basis for comparing the degree to which each industry may be affected by changes in transportation services, costs, and performance.

**Figure 1-12: Dependence of I-70 Industry Types on Commercial Trucking**



*Source: WSA Generated Table Using Woods and Poole 2006 CEEDS Data*

**Figure 1-13: Dependence of I-70 Basic Industries on In-House Transportation Services**



*Source: WSA Generated Table Using Woods and Poole 2006 CEEDS Data*

**Figure 1-12** compares the dependence of different industry groups on commercial trucking and warehousing, and **Figure 1-13** compares the dependency of in-house transportation services (which consist of company owned trucks or other vehicles) to produce one dollar of output.

The vertical axes on **Figures 1-12** and **1-13** illustrate dollars each industry must spend in transportation to produce one dollar of output. The figures show the primary industries in the area surrounding I-70 (manufacturing and retail/wholesale trade) have higher than average dependency on both trucking and in-house transportation services which may utilize the Corridor.

### 1.3.1. Dependence of Manufacturing on Trucking on I-70

**Figure 1-12** illustrates that the manufacturing industry ties with construction as the industry group most dependent on commercial trucking to produce output. Increasingly, manufacturers in collaborative supply chain technologies seek to avoid inventory holding costs by relying on smaller, agile, time-sensitive deliveries. Strategies such as just-in-time (JIT) production require manufacturers to tailor operational strategies, schedules, and quantities to rapidly changing market demand. The increasing need for flexibility in scheduling and distribution patterns among manufacturing firms makes transportation efficiency and the avoidance of travel incident-induced delays especially important.

Given the concentration of manufacturing activity on I-70 in 2030, it is critical that a solution to the performance issues facing I-70 maximize the efficiency and reliability

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of the Corridor for the commercial trucking of time-sensitive commodities supporting manufacturing.

### 1.3.2. Dependence of Wholesale and Retail Trade on Trucking

The location quotients in Table 1-4 show retail and wholesale trade industries are expected to be the second and third most concentrated industries in the proposed project area in 2030. Figure 1-12 shows that the retail industry is more dependent on in-house trucking and transportation than most other industries. This is important because the in-house transportation investment of retail firms is increasingly associated with retail firms that manage supply chains using point of sale and other data. Electronic data-driven supply chain and inventory management strategies such as Vendor Managed Inventory (VMI), Continuous Stock Replenishment (CSR), and Efficient Customer Response (ECR) in the retail industry result in reliance on smaller and more time-sensitive deliveries, with fewer inventories kept in warehouses. Recurring congestion can interfere with such deliveries, resulting in stock-outs which cost retailers money and deny consumers and businesses access to goods at the needed time. As with manufacturing, incident-induced delay resulting from crashes are unpredictable and, therefore, more costly to vendors and more likely to interfere with retail trade dependent on I-70.

### Intermodal Connections

I-70 presents significant opportunities to enhance the delivery of goods for manufacturing, retail, and wholesale trade throughout the Midwest, the nation, and internationally. Opportunities, including the examples that follow, for intermodal connectivity are discussed in Section 2.2.2 and 1.5.

**Example:** Kansas City, Missouri is seeking to become one of the first-ever foreign customs inspection offices on U.S. soil with a new Mexican Customs Clearance Facility. With new rail intermodal centers at the crossroads of I-70, I-29 and I-35, Kansas City intends to solidify its role as an integral trade center of the North American Continent Trade Corridor. I-70 is positioned to become one of the integral spokes for both national and NAFTA trade connections in the United States with rail and trucking linkages to Canada and Mexico.

**Example:** In the Columbus, Ohio area, the Rickenbacker International Airport is currently developing a Global Logistics Park. The performance of I-70 is critical to realize the rewards of both national and international trade, as well as regional and local retail and wholesale activity.

The concentration of trade activity dependent on I-70 makes finding a solution to the performance issues facing I-70 critical to the region, the I-70 Corridor states, and the nation as a whole.



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### 1.4. NATIONAL SIGNIFICANCE

The above analysis demonstrates both the emerging need to manage I-70's freight performance and the ways in which the economic base of the area surrounding I-70 makes truck traffic especially important to the vitality of major industry groups using the Corridor. The importance of I-70's performance as a national truck route extends beyond the 25 mile reach of counties surrounding the Corridor.

*I-70 needs a truck oriented solution to provide safe mobility at the national level.*

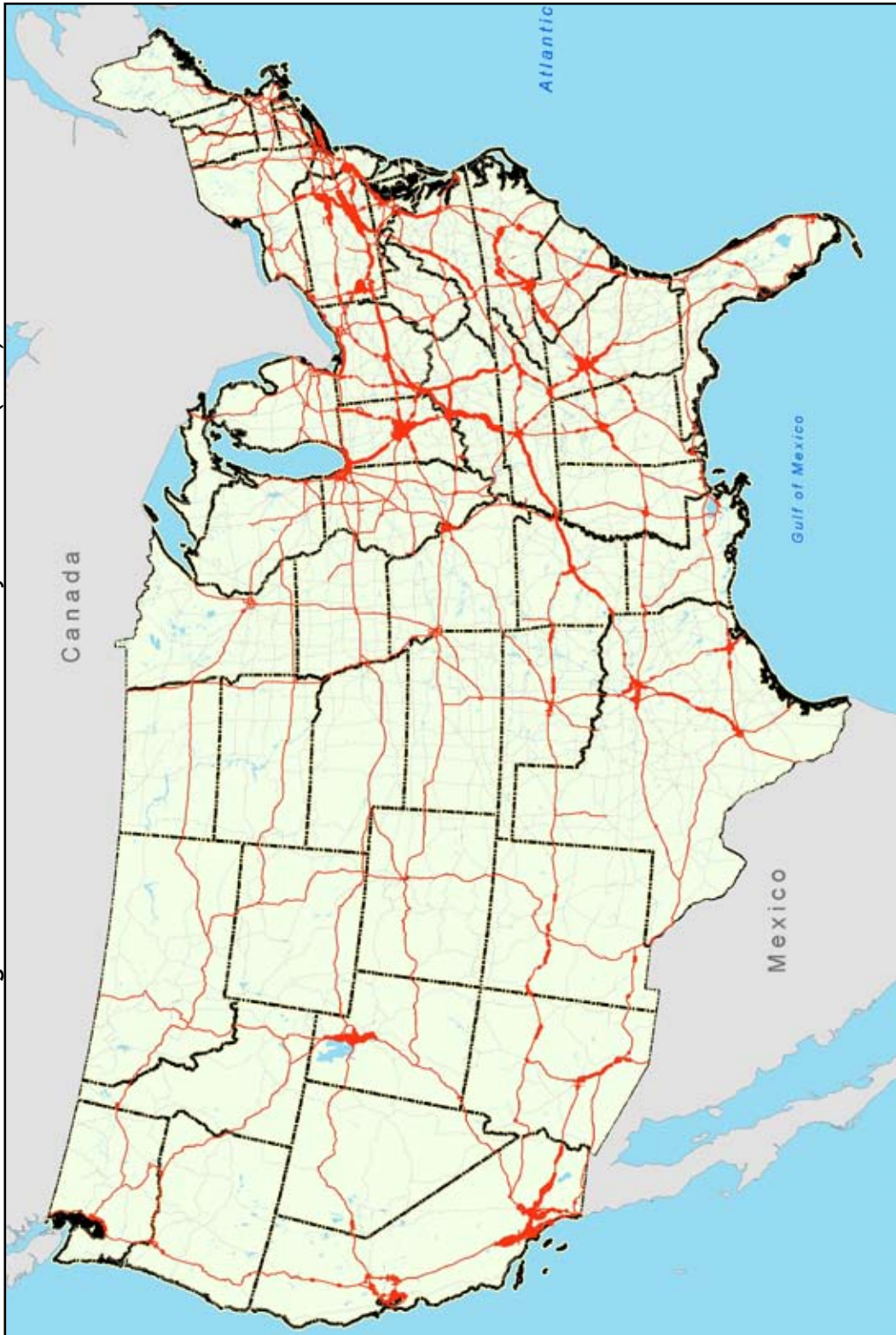
As presented in Figure 1-2, and described in Section 1.1, the I-70 Corridor connects with 11 interstates. The national Freight Analysis Framework (FAF<sup>2</sup>) has found that today, and in the future, these interstates are among the most heavily utilized trucking routes in the United States. Figure 1-14 illustrates that I-70 and the other interstates in the northern Midwest will be some of the most heavily

traveled freight corridors in the nation. This application, however, is not just about the relief of existing and projected congestion. It is about providing an opportunity for freight efficiencies to the trucking industry of a type and magnitude that exist nowhere else in the nation. With this comes the opportunity to relieve congestion on other corridors and to add a new dimension to freight logistics and efficiencies.

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Figure 1-14: Estimated National Daily Truck Traffic (2035)

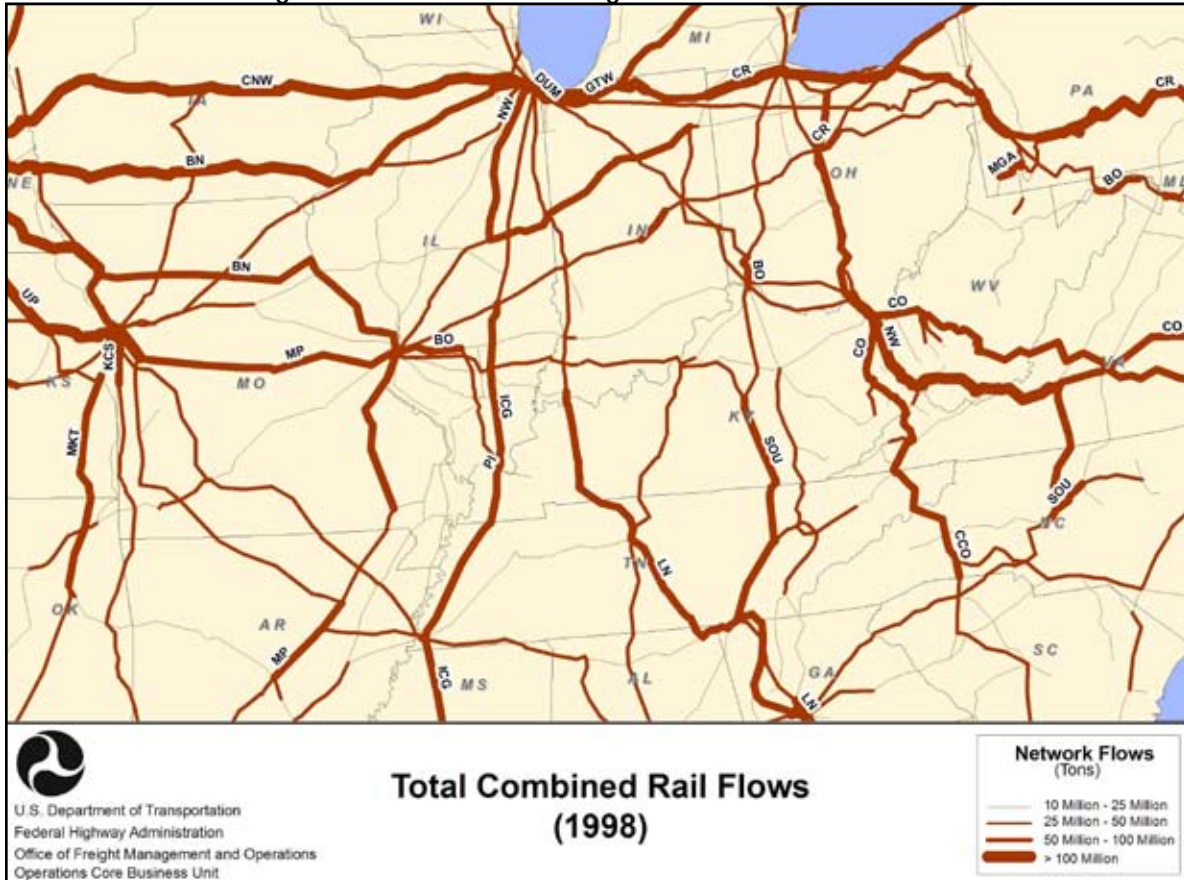


Source: FHWA Freight Analysis Framework (FAF<sup>2</sup>)

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Figure 1-15: 1998 Rail Freight Flows in the Midwest



In terms of the U.S. rail system, the I-70 Corridor project area is where east meets west. Figure 1-15 illustrates national rail flows in the upper Midwest. As discussed in Section 1.1, I-70 parallels or crosses all seven U.S. Class 1 railroads. This is significant since U.S. railroads are primarily private corporations whose service area and track infrastructure is typically either in the eastern or western U.S. The I-70 Corridor project area bridges the service areas of both the east and west based rail companies.

Currently, commodities traveling across the country by rail go into the Chicago area and switch from the western/eastern carriers and rail lines. If the I-70 TOLs Corridor project is completed, it would provide an option for long distance freight to trans-load in the intermodal facilities in the Kansas City or Columbus areas, and avoid the congestion in the Chicago and I-80/90 corridor.

### 1.5. STATE CONDITION AND SIGNIFICANCE

In each of the four states participating in this application, I-70 has unique congestion issues and makes critical national connections to support regional, national and international commerce, commodity flows, and passenger travel. As shown in Table 1-5,

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highways in these four states are now, and are projected in 2035, to carry the majority of commodities by tonnage and value to, from and within each state.

**Table 1-5: Freight Shipment To, From and Within I-70 Corridor States**

TON (M)	State Total		By Highway		% of Total		% Growth
	2002	2035	2002	2035	2002	2035	Highway
MO	751	1,484	564	1,144	75%	77%	103%
IL	2,469	3,887	1,690	2,844	68%	73%	68%
IN	1,153	2,327	752	1,558	65%	67%	107%
OH	1,458	2,415	960	1,710	66%	71%	78%
\$\$ (B)	State Total		By Highway		% of Total		% Growth
	2002	2035	2002	2035	2002	2035	Highway
MO	505	1,281	407	960	81%	75%	136%
IL	1,695	4,017	1,439	3,420	85%	85%	138%
IN	666	1,830	520	1,446	78%	79%	178%
OH	1,065	2,413	822	1,728	77%	72%	110%

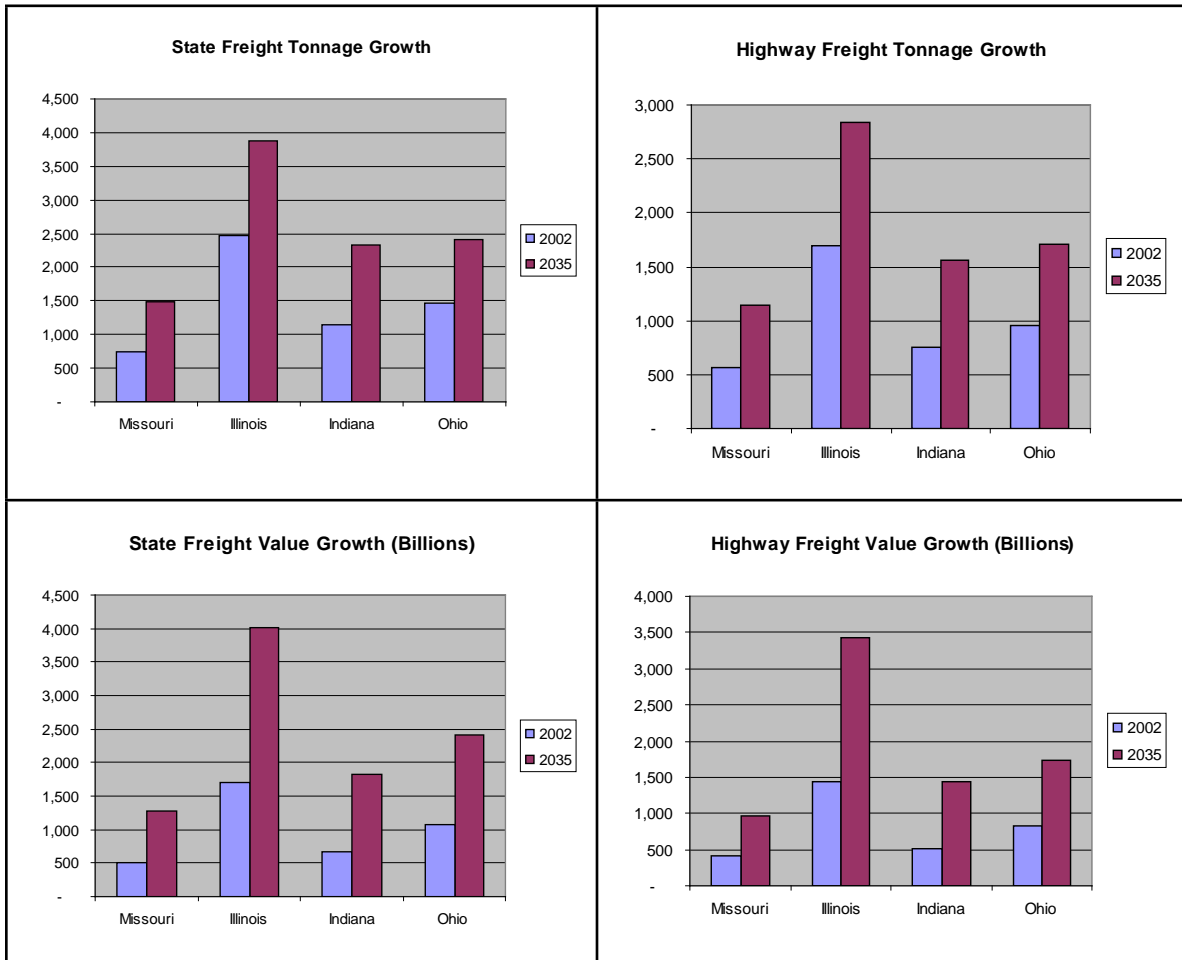
Source: FHWA Freight Analysis Framework (FAF<sup>2</sup>)



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Figure 1-16: Growth in Tonnage and Value of Freight Shipments To, From and Within the I-70 Corridor States



Source: FHWA Freight Analysis Framework (FAF<sup>2</sup>)

Figure 1-16 displays the growth in tonnage and in value of freight shipments to, from, and within the I-70 Corridor states, as presented in Table 1-5.

### 1.5.1. I-70 in Missouri

*Highways in these four states are now, and are projected in 2020, to carry the majority of commodities by tonnage and value to, from and within each state*

I-70 travels approximately 250 miles, crossing central Missouri and connecting its two largest cities, Kansas City and St. Louis.

**Highway:** Traffic volumes exceed 100,000 vehicles per day (VPD) in certain locations in Kansas City and St. Louis and reach 70,000 VPD in Columbia. Rural portions have

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volumes of 25,000 to 30,000 VPD. Several segments of I-70 experience traffic volumes of 130,000 to 160,000 ADT (average daily traffic).

Trucks generally comprise 20 to 30 percent of the volume. In some of the rural areas, trucks comprise up to 40 percent of the traffic volume. Projections are that truck traffic will double on I-70 by 2030, with approximately 3.5 percent growth per year. Passenger cars and pick-up truck volumes are anticipated to grow by about one percent per year. Projections indicate that many segments of I-70 in Missouri can be expected to operate at unacceptable levels of service by the year 2030. This will result in unstable traffic flows, stop-and-go conditions and traffic volumes greater than the roadway's capacity.

**Air Travel Connections to the Corridor:** Two major Missouri airports are located along I-70. Kansas City International Airport is the nation's 33rd largest air cargo airport. In 2005, approximately 925 million pounds of air cargo landed and five million passengers were enplaned there. The St. Louis Lambert Airport is the nation's 48th largest air cargo airport. In 2005, approximately 595 million pounds of air cargo and 6.85 million passengers were enplaned there.

**Truck and Freight Flows:** As shown in Table 1-5, 75 percent, by weight, and 81 percent, by value, of freight traveling in, out, or through Missouri is via highway. Growth in highway tonnage is expected to continue as the major mode of transportation. Highway tonnage growth is projected to grow 103 percent in volume to 77 percent, and 136 percent in value to 75 percent in 2035. Figure 1-17 shows this growth.

**Trading Partners:** Illinois, Kansas, and Ohio are among Missouri's top four trading partners. In 2002, trade with Illinois represented 24 percent of the tons and 19 percent of the value; trade with Kansas represented 14 percent of the tons and 10 percent of the value; and trade with Ohio represented five percent of the value of Missouri's total trade.

**Intermodal Connectivity:** St. Louis is located at the crossroads of I-55, I-44, I-64, and I-70. Kansas City is located at the crossroads of two of the nation's major interstates: I-29, I-35, and I-70. Both cities are located along the nation's largest navigable inland waterway system: the Missouri/Mississippi River system.

Kansas City has the second-largest rail center in the nation. The world's largest underground business complex, Sub Tropolis, is located in Kansas City, with nearly five million square feet for the storage and distribution of goods. Kansas City claims the largest Foreign Trade Zone in the United States with more than 10,000 acres serving companies such as Bayer, Kawasaki, Pfizer, and Sony. The former Richards-Gebaur Air Force Base has been converted to an international trade facility called the International Freight Gateway.

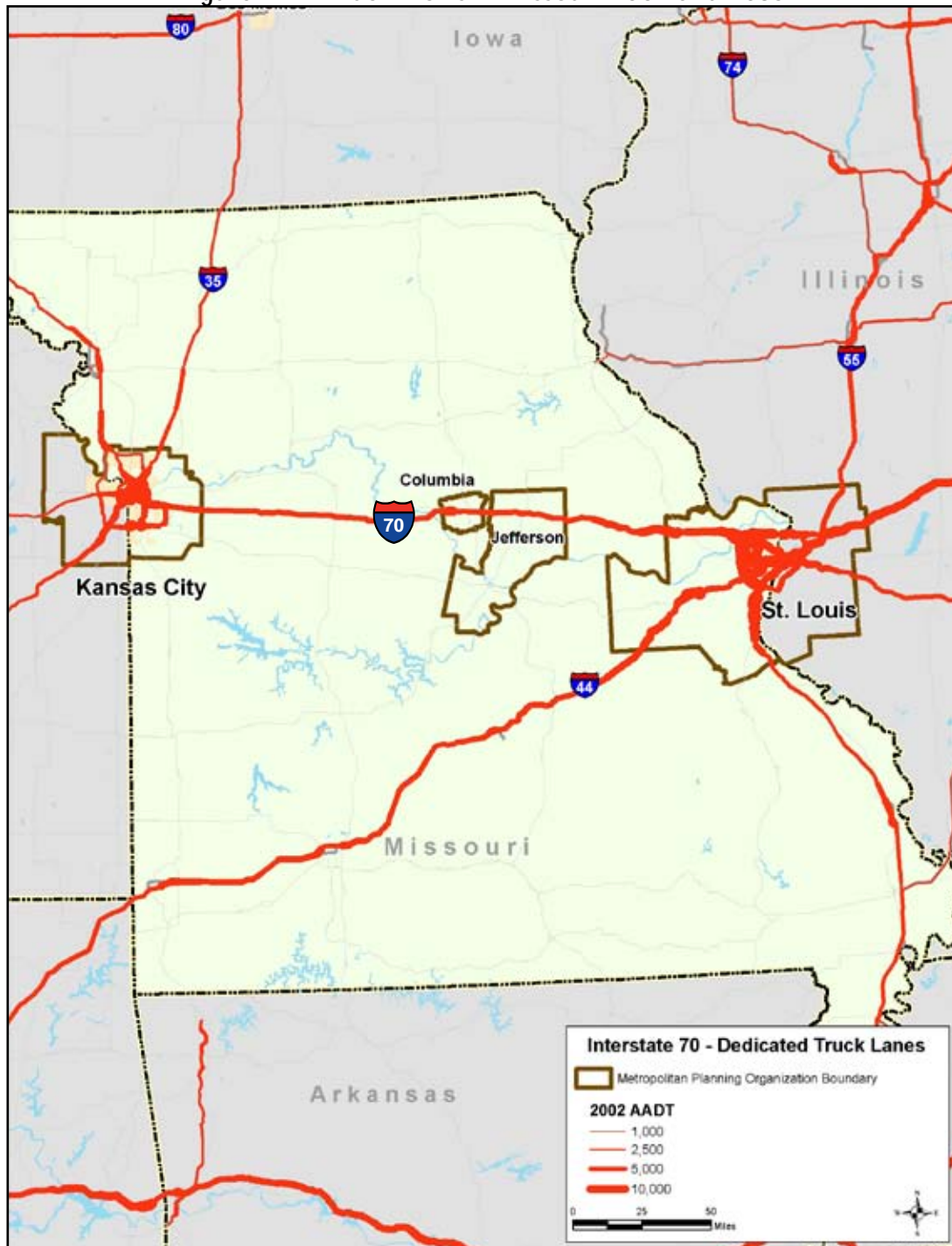
The North American Mid-Continent Trade Corridor permits Kansas City and its partners to market themselves jointly to businesses in Mexico, Canada, and other locations seeking shorter distribution times and costs. Like the Texas ports, some of the major Pacific ports such as Long Beach, Oakland, Tacoma, and Seattle are already beginning to suffer

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from congestion that will likely worsen as trade volumes and terrorism-related security measures increase.

Figure 1-17: Truck Flows in Missouri 2002 and 2035





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Figure 1-17: Truck Flows in Missouri 2002 and 2035, Continued



Source: FHWA (FAF<sup>2</sup>)

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The efficient performance of I-70 for truck traffic in Missouri is of critical national significance because:

- The Corridor connects major global centers of commerce in St. Louis and Kansas City;
- In each of these cities, the Corridor makes national and international connections to other interstates and other modes; and
- The Corridor provides an essential link for NAFTA trade through the center of America.

The sustained conditions and performance of I-70 in Missouri depend heavily on the suitability of the Corridor to perform these important trade functions. Seventy-eight (78) percent of surveyed Missourians identified truck traffic as a major problem. Pursuing an expanded I-70 with dedicated truck traffic lanes would help alleviate this concern. For all of these reasons, a new and innovative strategy for I-70, which addresses the efficiency, mobility and safety of truck traffic, is of vital national importance.

### 1.5.2. I-70 in Illinois

I-70 travels 167 miles, crossing the state of Illinois from west-to-east starting in Madison County in the St. Louis metropolitan area on the western side of the state, and ending at the Indiana state line in Clark County on the eastern side of the state.

**Highway:** Traffic Volumes range from 69,000 ADT in the western segments near St. Louis to 20,000 to 50,000 ADT in central rural locations. Trucks generally comprise 20 to 30 percent of the volume.

**Truck and Freight Flows:** As shown in Table 1-5, 68 percent, by weight, and 85 percent, by value, of freight traveling in, out, or through Illinois is via highway. Growth in highway tonnage is expected to continue as the major mode of transportation. Highway tonnage growth is projected to grow 68 percent in volume to 73 percent and 138 percent in value by 2035. Figure 1-18 shows this growth.

**Trading Partners:** Indiana and Missouri are among Illinois' top four trading partners. In 2002, trade with Indiana represented 16 percent of the tons and 13 percent of the value; trade with Missouri represented 10 percent of the tons and nine percent of the value of Illinois' total trade.

**Intermodal Connectivity:** In Illinois, I-70 is intersected by two major north-south interstates, I-55 and I-57. I-55 intersects I-70 on the western side of the state and I-57 intersects I-70 in the central part of the state at Effingham. Both of these interstates provide connectivity to the Chicago metropolitan area.

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Figure 1-18: Truck Flows in Illinois 2002 and 2035





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Figure 1-18: Truck Flows in Illinois 2002 and 2035, Continued



Source: FHWA (FAF<sup>2</sup>)

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The efficient performance of I-70 for truck traffic in Illinois is of critical national significance because the Corridor connects the national and international trade center in St. Louis to other major centers of commerce in Indianapolis and Chicago through connections in Illinois. Dramatically improved efficiency on I-70 has the ability to reroute through traffic out of Chicago, thus reducing congestion and associated air quality concerns in the Chicago metropolitan area.

### 1.5.3. I-70 in Indiana

I-70 travels approximately 150 miles crossing central Indiana and accommodates large and rapidly growing volumes of commercial traffic.

**Highway:** Average daily traffic across I-70 in Indiana is 56,501 vehicles per day and commercial truck traffic makes up 35 percent of the mix. Traffic in the rural portions of the state range from 22,000 to 67,000 ADT. **Figure 1-9** in **Section 1.2.4** and **Figure 1-1** in **Section 1.4** demonstrate that the urban Indianapolis portion of I-70 is projected to be totally gridlocked by 2030.

**Air Travel Connections to the Corridor:** The Indianapolis International Airport is the nation's 7th largest air cargo airport. Between 2004 and 2005 air cargo tonnage increased by 9.98 percent. In 2005, approximately five billion pounds of air cargo landed and 4.2 million passengers were enplaned there.

**Truck and Freight Flows:** As shown in **Table 1-5**, 65 percent, by weight, and 78 percent, by value, of freight traveling in, out, or through Indiana is by highway. Growth in highway tonnage is expected to continue as the major mode of transportation. Highway tonnage growth is projected to grow 107 percent in volume to 67 percent, and 178 percent in value to 79 percent in 2035. **Figure 1-19** shows this growth.

**Trading Partners:** Illinois and Ohio are among Indiana's top four trading partners. In 2002, trade with Illinois represented 27 percent of the tons and 20 percent of the value; trade with Ohio represented 12 percent of the tons and 13 percent of the value of Indiana's total trade.

**Intermodal Connectivity:** Indianapolis serves as a hub where three major interstates converge with I-70. Those interstates are I-65, I-69, and I-74. I-65 travels through the state from the Louisville, Kentucky metropolitan area on the Ohio River to the Chicago, Illinois metropolitan area at the northwest corner of the state. It provides vital connectivity to the Ohio River Jeffersonville Port and the Great Lakes Port of Indiana at Burns Harbor/Portage located 18 miles from Chicago on Lake Michigan. Adding 24 companies since 1985, the Ohio River Jeffersonville Port, across from Louisville, Kentucky, is one of the fastest growing ports on the Ohio River. It is adjacent to an area that has been called the automotive and appliance alley, and it provides intermodal facilities for steel, grain, bulk and project cargo. Burns Harbor on Lake Michigan services more ocean-going cargo than any other Great Lakes port. It handles 15 percent of the U.S. - European steel trade

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and five percent of U.S. international steel trade. I-69 connects I-70 to the automotive and automotive aftermarket manufactures located along a corridor stretching from Indianapolis, Indiana to Detroit, Michigan.

The Indianapolis metropolitan area is rapidly becoming a major player in logistics/distribution. The second-largest domestic FedEx hub is located at the Indianapolis International Airport, located next to the I-70 Corridor. Also in close proximity along the I-70 Corridor is a major logistics/distribution complex which has developed over the past 10 years in Hendricks County, immediately west of the Indianapolis Airport. The CSX rail intermodal facility is also situated to the north and west of the Indianapolis Airport in the town of Avon. These, plus many other manufacturing and biomedical facilities, rely upon the I-70 Corridor to ship and receive products.

Indiana also plans to extend I-69 to the southwest, connecting the I-70 Corridor to the city of Evansville, located on the banks of the Ohio River. I-69 is the NAFTA Highway and is intended to connect Mexico with Canada. I-74 crosses Indiana in a generally southeasterly direction from the Danville/Champaign Urbana, Illinois area to Cincinnati, Ohio.

Indiana also has two proposed intermodal facilities near the I-70 Corridor. These include the Terre Haute Inland Port Intermodal Facility and the Connersville Inland Port Intermodal Facility.



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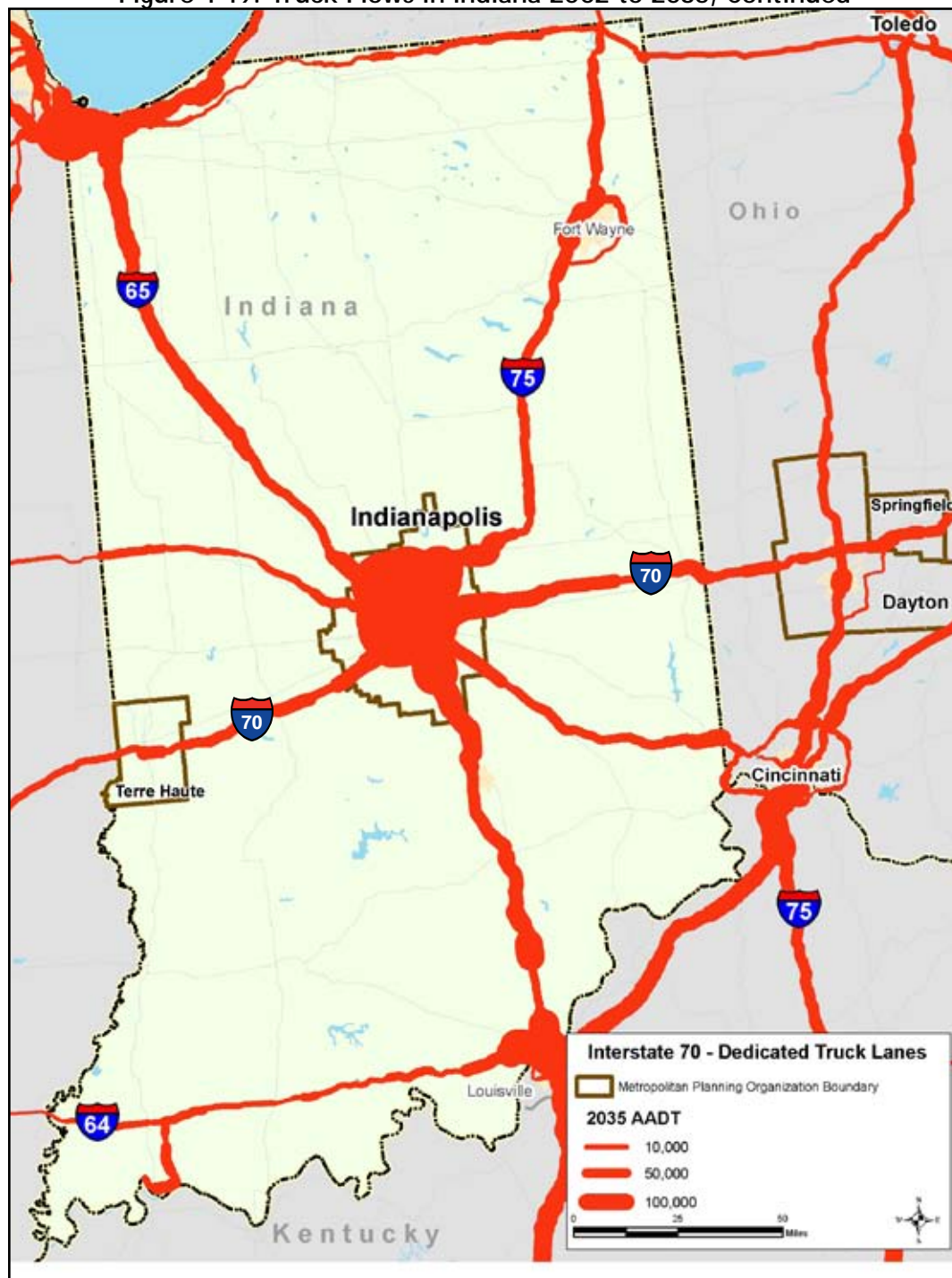
Figure 1-19: Truck Flows in Indiana 2002 to 2035



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Figure 1-19: Truck Flows in Indiana 2002 to 2035, Continued



Source: FHWA (FAF<sup>2</sup>)

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The efficient performance of I-70 for truck traffic in Indiana is of critical national significance because:

- With the advent of NAFTA, Indianapolis is fast becoming a national and global center of trade and commerce, placing growing demands on freight connections to the national interstate system;
- The planned expansion of NAFTA corridor I-69 to the southwest is expected to increase the volume of sensitive freight traffic on I-70 as a major connection to this new north-south route; and
- The I-70 Corridor provides an essential link for trans-continental trade through the center of America.

The sustained performance of I-70 in Indiana depends heavily on its suitability to perform as a corridor for heavy trucks. Like the other states along the Corridor, I-70 also serves as a major east-west interstate corridor through central Indiana. Average daily traffic across the I-70 Corridor in Indiana is 56,501 VPD, its commercial truck traffic makes up 35 percent of the traffic mix along I-70. The highest traffic concentrations along the Corridor can be found in Marion County on the outskirts of Indianapolis. For all of these reasons, a new and innovative strategy for I-70, which addresses the efficiency, mobility and safety of truck traffic, is of vital national importance.

### 1.5.4. I-70 in Ohio

I-70 travels approximately 235 miles across central Ohio.

**Highway:** Average daily traffic across I-70 in Ohio is 53,000 vehicles per day. Commercial truck traffic makes up a significant portion of the mix. Traffic in the rural portions of the state range from 26,000 to 42,000 ADT. The highest traffic concentrations can be found along the 145 mile segment from I-75 to I-77 that also includes two of Ohio's major urban areas: Dayton and Columbus. Urban area ADTs range from 99,000 to 156,000 vehicles per day.

**Air Travel Connections to the Corridor:** Ohio is home to two of the nation's top 40 air cargo facilities. James M. Cox - Dayton International Airport is the nation's 18th largest air cargo airport. In 2005, approximately 1.5 billion pounds of air cargo landed and 1.2 million passengers were enplaned there. Rickenbacker Airport is the 39th largest air cargo airport, landing 752 million pounds in 2005. Between 2004 and 2005 air cargo tonnage increased by 26.56 percent. Port Columbus International Airport enplanes 1.2 million passengers per year.

**Truck and Freight Flows:** As shown in Table 1-5, 66 percent, by weight, and 77 percent, by value, of freight traveling in, out, or through Ohio is via highway. Growth in highway tonnage is expected to continue as the major mode of transportation. Highway tonnage growth is projected to grow 78 percent in volume to 71 percent, and 110 percent in value to 72 percent in 2035. Figure 1-20 shows this growth.

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**Trading Partners:** Indiana and Pennsylvania are among Ohio's top four trading partners. In 2002, trade with Indiana represented 10 percent of the tons and 10 percent of the value; trade with Pennsylvania represented 11 percent of the tons and seven percent of the value of Ohio's total trade.

**Intermodal Connectivity:** While I-70 carries a substantial amount of daily traffic throughout the entire Corridor, the highest traffic concentrations can be found along the 145 mile segment from I-75 to I-77. These two junctions provide access via I-75 to port facilities on Lake Erie and the Ohio River. Both I-75 and I-77 are major north-south corridors.

Columbus is also the home of two major rail intermodal terminals: the Norfolk & Southern and the CSX terminals. The newly developing Rickenbacker Intermodal Facility in Columbus is a fast growing air, rail and trucking hub that connects to the Heartland Rail Corridor and the Port of Norfolk, and draws freight from throughout the nation.

I-70 intersects with three north-south interstates, I-75, I-71, and I-77, all of which provide connectivity to river ports on the Ohio River and the Lake Erie ports at Toledo and Cleveland. The Lake Erie ports at Toledo and Cleveland are part of the Great Lakes/St. Lawrence Seaway System, a waterborne freight transportation network capable of moving hundreds of millions of metric tons of international cargo per annum.



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Figure 1-20: Truck Flows in Ohio 2002 and 2035



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Figure 1-20: Truck Flows in Ohio 2002 and 2035, Continued



Source: FHWA (FAF<sup>2</sup>)

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The efficient performance of I-70 for truck traffic in Ohio is of critical national significance because:

- I-70 provides national freight connections to major rail intermodal terminals;
- The Corridor provides an essential link for trans-continental trade by making I-70's traffic to and from points west of Ohio accessible to the Great Lakes/St. Lawrence Seaway system ports of Toledo and Cleveland; and
- The Corridor provides links to I-75 to International Ports in Detroit, Michigan and the Ohio River port in Cincinnati, Ohio.

The sustained performance of I-70 in Ohio depends heavily on its suitability to perform as a corridor for heavy trucks. Based on a statewide ranking, the Ohio Department of Transportation has identified sections of I-70 between I-75 and I-77 as being some of the highest congested roadways in the state. Some of those sections have also been identified as exceeding design standards. For all of these reasons, a new and innovative strategy for I-70, which addresses the efficiency, mobility and safety of truck traffic, is of vital national importance.